UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

December 9, 2002

Ken Marcy
Remedial Project Manager
U.S. Environmental Protection Agency
Region 10 ECL-111
1200 Sixth Avenue
Seattle, Washington 98101-1128

Re: Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Consultation for Area 5106 Removal Action, Commencement Bay Nearshore/Tideflats Superfund Site, Tacoma, WA
(NOAA Fisheries Tracking Number 2002-00878)

Dear Mr. Marcy:

In accordance with Section 7 of the Endangered Species Act (ESA), as amended (16 U.S.C. 1531 *et seq.*) and the Magnuson Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996, the attached document transmits the National Marine Fisheries Service's (National Oceanic and Atmospheric Administration [NOAA] Fisheries) Biological Opinion (Opinion) and MSA Essential Fish Habitat (EFH) consultation on the Superfund removal action of Area 5106 within Commencement Bay in Pierce County, Washington. The U.S. Environmental Protection Agency (EPA) has determined that the proposed action may affect, and is likely to adversely affect, the Puget Sound (PS) chinook (*Oncorhynchus tshawytscha*) Evolutionarily Significant Unit.

The enclosed Biological Opinion (Opinion) reflects the results of a formal ESA consultation and contains an analysis of effects covering PS chinook in Commencement Bay, Washington. The Opinion is based on information provided in the Biological Assessment received in NOAA Fisheries from the EPA on July 18, 2002 and additional information subsequently transmitted via meetings, telephone conversations, fax and E-mail. A complete administrative record of this consultation is on file at the Washington Habitat Branch Office. NOAA Fisheries concludes that implementation of the proposed project is not likely to jeopardize the continued existence of PS chinook. In your review, please note that the incidental take statement, which includes Reasonable and Prudent Measures and Terms and Conditions, is designed to minimize incidental take and avoid jeopardy.

The MSA consultation concluded that the proposed project may adversely impact designated Essential Fish Habitat (EFH) for chinook and other estuarine species. The Reasonable and Prudent Measures of the ESA consultation, and Terms and Conditions identified therein, would minimize the adverse effects from the proposed EPA actions. Therefore, NOAA Fisheries recommends that they be adopted as EFH conservation measures.

If you have any questions, please contact Robert Clark at (206) 526-4338.

Sincerely,

for

D. Robert Lohn
Regional Administrator

Enclosure

Endangered Species Act - Section 7 Consultation
Biological Opinion
&
Magnuson-Stevens Fishery Conservation and Management Act
Essential Fish Habitat Consultation

NOAA FISHERIES No. 2002/00878

Area 5106 Removal Action
Commencement Bay Nearshore/Tideflats
Superfund Site, Tacoma, Washington

Agency: Environmental Protection Agency

Consultation Conducted By: National Marine Fisheries Service
Northwest Region

Issued by: for D. Robert Lohn
Regional Administrator

Date: December 9, 2002

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1.0 INTRODUCTION

1.1 Background and Consultation History

On July 18, 2002, the National Marine Fisheries Service (National Oceanic and Atmospheric Administration [NOAA Fisheries]) received a Biological Assessment (BA; July 2000), an Addendum (BA Addendum; June 25, 2002, Revised July 2, 2002), an Essential Fish Habitat Assessment (July 9, 2002), and a request for Endangered Species Act (ESA) Section 7 consultation from the United States Environmental Protection Agency (EPA). Formal ESA consultation was initiated on July 18, 2002, because EPA concluded that, while it may be difficult to quantify demonstrable impacts to listed resources by this action, the conservative position must be taken that the proposed dredging and disposal activities are likely to adversely affect PS chinook in the short term.

The Occidental Chemical Corporation (OCC) has agreed to remove, treat, and dispose of sediments contaminated with volatile and semivolatile organic compounds. The purpose of the Area 5106 Removal Action is to address unacceptable risks to the environment and public health from the Area 5106 sediments. Dredging will remove sediment with elevated levels of chlorinated organic solvents, especially tetrachloroethene and trichloroethene, exposing the native sand layer. EPA's removal order to OCC is considered a Federal action under ESA. The proposed project occurs within the Puget Sound (PS) chinook (*Oncorhynchus tshawytscha*) Evolutionary Significant Unit (ESU).

In this Superfund cleanup action, the contaminated sediments are located in the Hylebos Waterway waterward of the Pioneer Americas, Inc. property (formerly owned by OCC) and defined as Area 5106. The Hylebos Waterway, the site of the proposed contaminated sediment dredging project, and the Blair Waterway Slip 1, the site of the proposed disposal site of the treated sediments, are located within the industrial tideflats area of Commencement Bay, Tacoma, Washington. The proposed action will replace highly contaminated intertidal and subtidal sediments with chemically-clean relic deltatic substrates and is self-mitigating. NOAA Fisheries concurs with the EPA effect determination of Likely to Adversely Affect.

The objective of this Biological Opinion (Opinion) is to determine whether the proposed action is likely to jeopardize the continued existence of PS chinook. The standards for determining jeopardy are described in Section 7(a)(2) of the ESA and further defined in 50 C.F.R. 402.14. This Opinion is based on information provided in the original BA (USEPA 2000), the BA Addendum, meetings, mail correspondence, e-mail correspondence, and phone conversations. This document also presents NOAA Fisheries' consultation covering Essential Fish Habitat (EFH) under the Magnuson-Stevens Fishery Conservation and Management Act (MSA).

It should be noted that all aspects of constructing the Slip 1 closure berm, filling Slip 1, and compensatory mitigation to occur in Slip 5 are addressed in a separate BA prepared for the Terminal 3/4 Northern Expansion Project (Pacific International Engineering 2000; as revised in 2001). Thus, to reduce repetition, the potential habitat effects associated with the placement of

treated Area 5106 sediments in Slip 1 are not being addressed as part of this Opinion. This Opinion addresses only a specific set of issues related exclusively to the disposal of Area 5106 sediments in the Slip 1 Confined Disposal Facility (CDF) (i.e., potential water quality impacts).

Further, remedial actions associated with the cleanup of other Mouth of Hylebos Waterway sediments are addressed in a separate BA Addendum prepared for the Mouth of Hylebos Waterway Problem Area: Segment 5 CB/NT Superfund Site (Pacific International Engineering and Anchor Environmental 2001). That BA Addendum also addressed a specific set of issues related to the use of Slip 1 as a CDF, including (1) Demolition of Piers 1 and 2 within Slip 1 (NOAA Fisheries 2002/00847), (2) Dredging of the Slip 1 berm stabilization key trench, (3) Construction of the Slip 1 closure berm, including filling the berm stabilization key, and placement of a temporary buttress fill at the base of the berm (NOAA Fisheries 2002/01112), (4) Disposal of dredged Segment 5 sediments within the Slip 1 CDF, (5) Construction of the primary and final caps, and (6) Monitoring as approved by the EPA.

1.2 Description of the Proposed Action

The EPA proposes to issue an approval to OCC to proceed, under Superfund authority, with the dredging, treating and dewatering of contaminated sediments from Area 5106 for disposal in the Slip 1 CDF. Area 5106 sediment is defined as those sediments requiring treatment prior to placement within the Slip 1 disposal site.

1.2.1 Dredging

Based on the confirmed horizontal and vertical boundaries of the Area 5106 sediments, the quantity of Area 5106 Sediments is estimated to be 22,300 cubic yards. It is anticipated that during the course of dredging an additional volume consisting of horizontal and vertical boundary sediments will be removed due to sloughing and overdredging, respectively. Overall, a total volume of approximately 32,000 cubic yards is expected to be removed for treatment under the Area 5106 Removal Action. During the Area 5106 Sediment Characterization it was determined that the vertical limits of Area 5106 sediments coincide with the top of the native sand layer. Thus, sediments will be removed to the top of the native sand layer within the horizontal limits of Area 5106 sediments. The removal will be confirmed during dredging utilizing an appropriate survey methodology. Dredging elevations will range from approximately –42.7 ft, mean lower low water (MLLW), outside the pier line to approximately 0 ft MLLW for the upslope portion of the dredging.

EPA will remove Area 5106 sediments using a combination of a high solids hydraulic suction dredge ("TOYO pump") and mechanical dredging. The TOYO pump was specifically selected by EPA and the US Army Corps of Engineers (USACOE) as the best available dredging technology to minimize suspension of sediment during dredging and thereby limit the potential for water quality impacts (CRA 1999a). The dredging will initially use a TOYO pump to remove Area 5106 sediment, as long as the solids content of the dredged sediment is greater than 20 percent by weight. The percent solids will be monitored on a regular basis during dredging.

When the solids content consistently falls below the target 20 percent, the TOYO pump will be moved to another location. If necessary, mechanical dredging will follow the TOYO pump to remove any remaining Area 5106 sediment. Mechanical dredging operations, if required, will be conducted from the same barge used for the TOYO pump dredging utilizing the same derrick equipped with a standard 4-cubic yard clamshell bucket. EPA will use a decontamination hopper during mechanical dredging to rinse loose sediment from the clamshell between each dredge cycle.

To dredge occur under existing overwater structures EPA will use either a barge mounted Gradall or TOYO pump. Specifically, a barge mounted Gradall will move the Area 5106 Sediment down the slope to a location outside the pier line where the TOYO pump will remove the Area 5106 sediment for treatment. Dock bracing will be removed and reinstalled as necessary. Areas not accessible by Gradall (around pilings) will be removed utilizing either a TOYO pump or, if necessary, a diver articulated hydraulic dredge. Dredged sediments will be pumped to an upland storage tank.

1.2.2 Treatment

The treatment and dewatering processes will occur on uplands adjacent to the Hylebos Waterway. EPA will pump the dredged sediments from the storage tank to the first of two 25,000-gallon, covered tanks for treatment. Each treatment tank will be equipped with an agitator with an air dispersion impeller, air diffusers, internal baffles, and steam inlet nozzles. At startup, the dredged sediment in the storage tank will be mixed with seawater in treatment tank No.1 to form a slurry consisting of 15 percent solids by weight. The mixing slurry will be heated with steam and maintained at a temperature of approximately 45˚C. Simultaneously, a blower will add air to the bottom of the tank at the rate of approximately 1,300 cubic feet per minute (cfm). The agitator impeller will maximize the air/slurry contact and improve volatilization of contaminants.

Target volatile organic compounds and semi-volatile organic compounds will be removed from the slurry in the vapor phase. A 4,000 cfm fan will draw the vapor streams from the storage tank and the treatment tanks through vapor-phase activated carbon beds where the organic compounds will be removed. Treated sediments will be transferred to a dewatering area.

1.2.3 Dewatering

A qualified contractor specializing in the dewatering of sludges and slurries will conduct the dewatering, using methods selected by the contractor and approved by OCC. The dewatering contractor may use the following equipment, including but not necessarily limited to: belt filters, plate and frame presses, centrifuges, and bag filters. OCC's bench scale testing indicates that addition of a flocculant will likely be required for effective dewatering of the treated slurry. The contractor will clarify and/or filter water removed from the treated slurry to remove solids that exceed specified discharge criteria for turbidity. Water that meets the discharge criteria will be pumped to recycle water tanks to be reused as required to maintain the appropriate water/solids

content in the slurry in the two sediment treatment tanks. Excess water in the recycle water tanks will be discharged into the Hylebos Waterway provided it meets EPA-approved water quality criteria.

1.2.4 Disposal

EPA will dispose of treated and dewatered Area 5106 sediment will be disposed of underwater within the Slip 1 CDF located nearby and adjacent to the Blair Waterway. EPA will first load the dewatered sediment into trucks or roll-off boxes and transport it from the dewatering area to the CDF, then unloaded it onto an asphalt paved storage area. The dewatered sediment will then be lowered by clamshell bucket to the mudline before being released into the CDF. EPA expects the final unconsolidated thickness of the treated Area 5106 sediment to be approximately 20 feet. Sediments dredged by others (outside of the scope of work of the Area 5106 Removal Action) from other portions of the Hylebos Waterway will subsequently be placed adjacent to and on top of the treated Area 5106 sediment in the CDF. However, because dredging of other Hylebos Waterway sediments is not scheduled to occur until the 2003/2004 in-water construction season, treated Area 5106 Sediments will remain accessible to listed salmonids through one in-water construction closure period.

1.2.5 Duration and Timing

The Project schedule for the Area 5106 Removal Action calls for in-water construction work to commence in September 2002 and occur over roughly a 13 week period, with dredging operations completed before February 15, 2003. This construction schedule is conservative and falls well within the EPA approved in-water work contaminated sediment period established for the protection of migrating juvenile salmonids (August 16 through February 14).

1.3 Description of the Action Area

The Action Area for the proposed project is considered to be the area southeast of a line running from the end of the training wall on the east side of the Puyallup River to Browns Point. The Action Area encompasses those portions of Commencement Bay and the shoreline that is southeast of this line, including all of Sitcum, Blair, and the Hylebos waterways and their shorelines, and the Milwaukee Habitat Area (mouth of the former Milwaukee Waterway) and its shoreline.

The Project Area (the area where construction activities will occur) encompasses approximately 2.17 acre, the majority of which (1.94 acres) is subtidal habitat, below –10 ft MLLW. Area 5106 is located waterward of the former OCC Facility, located at 605 Alexander Avenue in the City of Tacoma, Washington. The upland portion of the facility is approximately 33 acres in size. The facility is bounded on the northwest by Port of Tacoma property, on the southwest by Alexander Avenue, on the northeast by the Hylebos Waterway, and on the southeast by an OCC property, formerly owned by PRI Northwest, Inc.

2.0 ENDANGERED SPECIES ACT

2.1 Biological Opinion

2.1.1 Status of the Species

PS chinook salmon was listed on March 24, 1999 (64 Fed. Reg. 14308). The species status review identified the high level of hatchery production which masks severe population depression in the ESU, as well as severe degradation of spawning and rearing habitats, and restriction or elimination of migratory access as causes for the range-wide decline in PS chinook salmon stocks (NOAA Fisheries 1998a, and 1998b). Within the Puyallup basin, virtually all salmon spawn in the Puyallup River, outside of Commencement Bay. The naturally spawning chinook population in the Puyallup River is comprised of an unknown mixture of natural and hatchery origin fish.

Juvenile chinook migrating through the Puyallup River delta and Commencement Bay originate from three basic stocks (Wash. SASSI, 1992): White (Puyallup) River spring; White River summer/fall; and Puyallup River fall. Juvenile salmon use estuaries for physiological adaption, foraging, and refuge. As described by Simenstad (2000), some aspects of the early life history of juveniles in estuaries are obligatory, such as the physiological requirement to adapt from freshwater to saltwater. Generalized habitat requirements of juvenile chinook in estuaries include shallow-water, typically low gradient habitats with fine unconsolidated substrates and aquatic, emergent vegetation; areas of low current and wave energy; and concentrations of small epibenthic invertebrates (Simenstad *et al.* 1985).

Artificial propagation programs likely provide most of the numbers of chinook in the Puyallup River. The White River spring chinook population which is considered critical by state and tribal fisheries managers depends largely on artificial production (Wash. SASSI 1992). The White River spring chinook have lately experienced a tenuous rebound as escapement gradually has increased from the historic lows of the 1980s. In 2000, non-tagged returns of adults was 1,732 individuals, the largest return in 30 years. This increase is consistent with larger numbers of chinook in the Columbia River during 2000, indicating good ocean survival (NOAA Fisheries 2001).

The White River summer/fall chinook stock is considered wild and classified by the co-managers as distinct based on geographic distribution. The glacial melt waters, typical of the Puyallup River, cause poor visibility during spawning season. Due to this, the stock status is unknown (Wash. SASSI 1992).

Numbers of Puyallup fall chinook have recently been compiled by the Puyallup Tribe of Indians for the Washington State Shared Strategy indicating the current number of spawners at 2,400. The Washington Shared Strategy is a voluntary and collaborative effort that is developing goals for recovery planning ranges and targets building on existing efforts of local governments, watershed groups, and various state, Federal, and tribal entities to produce a viable recovery

plan. Targets relating the quality and capacity of chinook habitat to population response associated with recovered habitat indicated a range of 5,300 to 18,000 spawners necessary for a recovered system (Puyallup Tribe 2002).

Field observations of PS chinook in the action area revealed that habitat use differed between the mouth and the head of waterways and also between the locations of the waterways in relation to the Puyallup River. The Puyallup Tribe of Indians conducted beach seine sampling between the years 1980 -1995 (however, no data were available in 1988, 1989, and 1990). Dukar *et al.* (1989) conducted an extensive beach seine juvenile sampling effort in 1983 at many of the same beach seine sampling locations as the tribe's efforts plus tow net sampling to investigate distribution in the open water habitats of Commencement Bay. In addition, sampling of salmonid distribution has been conducted at a number of sites during the course of impact assessment and/or mitigation site planning. Some general conclusions from these studies indicated that: juvenile chinook are present in low numbers in March, peak in late May or early June and drop to low numbers again by July 1; the progeny of naturally spawned chinook arrive in the estuary throughout this period at a variety of lengths; offshore catches of chinook peak about 2 weeks later than shoreline catches; and all shorelines are used but catches are typically higher near the mouths of the waterways than near the heads (Kerwin 1999). Hooper (in USFWS 2001) compiled catch per unit effort of chinook salmon at sites close to and further away from the Puyallup River. This data found that the catch per unit effort averaged 20.4 in the Milwaukee Waterway, 2.93 in the Blair Waterway and 1.99 in the Hylebos Waterway. The catch per unit was higher in the waterways closest to the river (USFWS 2001).

2.1.2 Evaluating Proposed Actions

The standards for determining jeopardy are set forth in Section 7(a)(2) of the ESA as defined by 50 C.F.R. Part 402 (the consultation regulations). NOAA Fisheries must determine whether the action is likely to jeopardize the listed species and/or whether the action is likely to destroy or adversely modify habitat. This analysis involves the initial steps of: (1) defining the biological requirements and current status of the listed species; and (2) evaluating the relevance of the environmental baseline to the species' current status.

From that, NOAA Fisheries evaluates whether the action is likely to jeopardize the listed species by determining if the species can be expected to survive with an adequate potential for recovery. In making this determination, NOAA Fisheries must consider the estimated level of injury and mortality attributable to: (1) collective effects of the proposed or continuing action, (2) the environmental baseline, and (3) any cumulative effects. This evaluation must take into account measures for survival and recovery specific to the listed species' life stages that occur beyond the action area. A finding of jeopardy is appropriate if the action, together with the baseline conditions and cumulative effects appreciable reduces the species' likelihood of survival or recovery by reducing the numbers, distribution, or reproduction of the species. If NOAA Fisheries finds that the action is likely to jeopardize, NOAA Fisheries must identify reasonable and prudent alternatives for the action.

For this specific action, NOAA Fisheries' analysis considers the extent to which the proposed action impairs the function of habitat elements necessary for rearing, refugia, and migration of PS chinook salmon in view of the fact that the proposed action occurs within the PS chinook ESU. Hylebos and Blair Waterways, sites of the proposed project, are several of the waterways located within the industrial area of Commencement Bay.

2.1.3 Biological Requirements

The first step NOAA Fisheries uses when conducting the ESA Section 7(a)(2) analysis is to define the species' biological requirements within the action area. NOAA Fisheries then considers the current status of the listed species taking into account species information, *e.g.,* population size, trends, distribution, and genetic diversity. To assess the current status of the listed species NOAA Fisheries starts with the determinations made in its decision to list for ESA protection the ESUs considered in this Opinion and also considers any new data that are relevant to the determination.

Biological requirements are those necessary for the listed ESU's to survive and recover to naturally reproducing population sizes at which protection under the ESA would become unnecessary. This will occur when populations are large enough to safeguard the genetic diversity of the listed ESUs, enhance their capacity to adapt to various environmental conditions, and allow them to become self-sustaining in the natural environment. The biological requirements for PS chinook include adequate food (energy) source, flow regime, water quality, habitat structure, passage conditions (migratory access to and from potential spawning and rearing areas), and biotic interactions (Spence *et al.* 1996). The specific biological requirements for PS chinook that are influenced by the action considered in this Opinion include food, water quality, habitat structure, and biotic interactions.

2.1.4 Environmental Baseline

The environmental baseline represents the current conditions to which the effects of the proposed action would be added. The term "environmental baseline" means "the past and present impacts of all Federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early Section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation in process" (50 C.F.R. 402.02).

Numerous activities affect the present environmental baseline conditions in the Action Area including expanding urban development, railroads, shipping, logging, agriculture, and other industries. The present port area of Tacoma was created during the late 1800s and early part of the 1900s by filling the tidal marsh that had developed on the shelf of the Puyallup River delta. Continuing habitat alterations such as dredging, relocation and diking of the Puyallup River, dredging/construction of the waterways for purposes of navigation and commerce, steepening and hardening formerly sloping and/or soft shorelines with a variety of material, and the ongoing

development of the Port of Tacoma and other entities has resulted in substantial habitat loss (Sherwood *et al.* 1990, Simenstad *et al.* 1993).

Historically, this area comprised the estuarine delta of the Puyallup River. With the growth and development of Tacoma, its port, and the surrounding region, the delta has been subjected to dramatic environmental changes, primarily from dredging and filling to create the waterways. Past development activities along the shorelines of Commencement Bay have affected, and future activities may affect, the habitat and the fish that use it (Duker *et al.* 1989). It has been estimated that of the original 2,100 acres of historical intertidal mudflat, approximately 180 acres remain today (USACOE *et al.* 1993). Fifty-five acres of the 180 acres of low gradient habitat is located near the mouth of the Puyallup River, twenty acres is the Milwaukee habitat area, 18 acres is located bayward of the East Eleventh Street Bridge in the Hylebos Waterway, 54 acres are located in the rest of the Hylebos Waterway, 46 acres is present along the shoreline from the mouth of the Hylebos to Browns Point, and eight acres are located in the Blair Waterway (Pacific International Engineering 2001a). Graeber (1999) states that 70 percent of Commencement Bay estuarine wetlands and over 98 percent of the historic Puyallup River estuary wetlands have been lost over the past 125 years.

The historical migration routes of anadromous salmonids into off-channel distributary channels and sloughs have largely been eliminated and historical saltwater transition zones are lacking (Kerwin 1999). Additionally, the chemical contamination of sediments, in certain areas of the Bay, has compromised the effectiveness of the habitat (USACOE 1993; USFWS and NOAA 1997).

In 1981, the EPA listed Commencement Bay as a Federal Superfund site. As a result of this, the clean up of contaminants has been a high priority and has resulted in 63 of 70 sites remediated (Kerwin 1999). In 1993-1995, the entire Blair Waterway navigation channel was dredged as part of the Sitcum Waterway Remediation Project. Contaminated sediments were removed and capped in the Milwaukee Waterway nearshore confined disposal site. After the completion of the dredging, the EPA deleted the Blair Waterway and all lands that drain to the Blair Waterway from the National Priorities List (Pacific International Engineering 2001a).

The shorelines of Commencement Bay have been highly altered by the use of riprap and other materials to provide bank protection. Bulkheads cover 71 % of the length of the Commencement Bay shoreline. Based on shoreline surveys and aerial photo interpretation of the area, approximately 5 miles, or 20 percent of the Commencement Bay shoreline, is covered by wide over-water structures (Kerwin 1999). These highly modified habitats generally provide poor habitat for salmon (Spence *et al.* 1996).

From 1917 to 1927, most of the habitat alteration (162 acres of mudflat, 72 acres of marsh) resulted from dredging the various waterways and from filling to build uplands for piers, wharves, and warehouses (USFWS and NOAA 1996). Currently natural aquatic habitats are highly fragmented and dispersed across the delta and Bay with few natural corridors linking them. Fish preferentially occupy shallow water areas, and have been documented in mitigation

and restoration sites (Miyamoto *et al.* 1980, Dukar *et al.* 1989, Pacific International Engineering 1999) both north and south of the river mouth, although perhaps tending more to the north (Simenstad 2000). Commencement Bay is a documented rearing and migration corridor for chinook salmon (Pacific International Engineering 1999, Wash. SASSI 1992, Duker *et al.* 1989, Simenstad *et al.* 1982, Simenstad 2000). Some modified and relic habitats and most mitigation habitats along the delta front and in the waterways still support juvenile salmon by providing attributes such as food and refuge. However, negative impacts to salmon from their migration through and residence in the delta-Bay system has not been quantified (Simenstad 2000).

At present, salmonid habitat within Commencement Bay shorelines is gradually increasing in acreage because of habitat restoration projects and natural processes. Approximately 50 acres of intertidal and shallow subtidal habitat have been created through previous restoration actions.

The Port currently comprises 2,400 acres of upland that support numerous commercial or industrial activities located on or adjacent to each of the waterways (Blair, Hylebos, and Sitcum). Some of these industries include pulp and lumber mills, shipbuilding and ship repair facilities, shipping docks, marinas, chlorine and chemical production, concrete production, aluminum smelting, oil refining and food processing plants, automotive repair shops, railroad operations, and numerous other storage, transportation, and chemical manufacturing plants.

The environmental baseline is significantly degraded. Ninety-eight percent of historically available intertidal marsh and mudflat habitat, necessary for estuarine lifestage (smoltification) of juvenile salmonids, has been lost due to the above described human activities. The remaining two percent of estuarine habitat is seriously degraded by the presence of toxic and hazardous contaminants in the sediments, which is the habitat for the prey organisms of juvenile salmonids. The baseline conditions of the action area are a significant factor in the current depressed status of PS chinook.

2.1.5 Effects of the Proposed Action

NOAA Fisheries must consider the estimated level of injury and mortality from the effects of the proposed action. ESA implementing regulations define "effects of the action" as "the direct and indirect effects of an action on the species or habitat together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline" (50 C.F.R. 402.02). "Indirect effects" are those that are caused by the proposed action and are later in time, but are still reasonably certain to occur.

2.1.5.1 Direct Effects

Direct effects are the immediate effects of the project on the species or its habitat. Direct effects result from the agency action and include the effects of interrelated and interdependent actions. Future federal actions that are not a direct, interdependent, or interrelated, effect of the action under consideration (and not included in the environmental baseline or treated as indirect effects) are not evaluated (50 C.F.R. 402.02).

The direct effects of the project derive from the nature, extent, and duration of the construction activities in the water and whether the fish are migrating and rearing at that time. Direct effects of the project also include immediate habitat modifications resulting from the project. In the proposed project, immediate positive effects include the removal of highly contaminated materials from the intertidal area which juvenile salmonids use. Negative effects may occur during various construction activities, including the dredging of highly contaminated sediments and the disposal of the treated sediments into the Slip 1 CDF. However, these effects are of limited duration.

2.1.5.1.1 Dredging

The Project Area (the area where construction activities will occur) encompasses approximately 2.17 acre, the majority of which (1.94 acres) is subtidal habitat, below –10 ft MLLW. A limited amount of dredging will extend up to approximately 0 ft MLLW along a portion of the Pioneer/Occidental Embankment. Limited Area 5016 dredging occurring above –10 ft MLLW will disturb a small amount of littoral habitat (approximately 0.23 acres). This action, when considered together with subsequent remedial actions to occur subsequently within the project area (*i.e.*, the Pioneer/Occidental Embankment capping action) does not permanently convert littoral habitat to subtidal. The project includes dredging of approximately 32,000 cubic yards of contaminated sediments.

Direct effects to fish from dredging can include injury by entrainment, and behavioral effects such as temporary avoidance of areas of higher turbidity and lower dissolved oxygen. The potential mechanisms by which turbidity could affect salmonids include direct mortality, sublethal effects (stress, gill damage, and increased susceptibility to disease), and behavioral responses (disruptions to feeding or migration) (Pacific International Engineering 2001b). Long-term ecosystem effects of dredging generally include changes in the volume and area of habitat, periodic changes to primary and secondary production (food web effects), and changes in hydrodynamics and sedimentology (Nightingale and Simenstad 2001).

As described in Section 1.2.1, EPA will dredge using a specialized hydraulic suction dredge (TOYO pump) as long as the solids content of the dredged sediment is greater than 20 percent by weight. The TOYO pump has been specifically selected as the best available dredging technology to minimize resuspension of sediment (limit turbidity) during dredging. The suction dredge head is cookie-cutter shaped, and starts on the sediment surface, cutting downward in a vertical pass; once the target depth is reached, the head is raised, moved to the adjacent segment, and the process continued.

The discharge of water from the treatment of dredge slurry during the dewatering process (process water) might also affect PS chinook. To ensure that process water meets the specified effluent quality for turbidity, process water will be filtered using a dual sand and anthracite filter capable of removing very fine particles to produce an effluent with less than 10 parts per million (ppm) of total suspended solids. EPA will also test effluent through the day using a turbidity meter to ensure that the effluent criteria are consistently achieved. Any process water discharged

to the Hylebos Waterway will meet EPA-approved Water Quality Criteria and would therefore not be harmful to listed species.

As needed, clamshell dredging will follow the TOYO pump to remove debris or larger materials, or materials that cannot be reached by the TOYO pump. Clamshell dredging causes very limited, short-term and localized turbidity; no long-term impacts should result from this turbidity. The amount and duration of turbidity during mechanical dredging will be controlled by adhering to the procedures and standards set forth in the Water Quality Criteria and EPA Water Certification.

Clamshell dredges have a bucket of hinged steel with a "clamshell" shape that is suspended from a crane. The bucket, with its jaws open, is lowered to the bottom surface. When the force of the bucket weight hits the bottom, the clamp grabs a section of sediments (Nightingale and Simenstad 2001). Because the jaws are open during descent, a clamshell is less likely to entrap or contain fish (Pacific International Engineering 2001a).

Overall, based on EPA's (2000) analysis of the effects of increased suspended sediment concentrations on salmonid species and the use of a TOYO pump to remove the majority of Area 5106 sediments, dredging to occur as part of the project would not produce suspended sediment concentrations dangerous to salmonids. Further, because EPA will ensure that dredging of contaminated sediments will not occur on or after February 15, with dredging to resume after August 15, of any year, the in-water work will occur when juvenile chinook salmon are not expected to be present in the action area.

While dredging normally causes a short-term decrease in the subtidal benthic community, due to the level of contamination and the physical quality of the substrate, the benthic community in the project area is seriously depressed. Therefore, the normal reduction in benthic prey from this type of dredging is not expected within the action area.

Interrelated to with the dredging is the subsequent capping of this dredge site with clean substrate of appropriate sediment material (*i.e.,* "habitat or fish mix"). The future capping of this site will occur within an approved work window to minimize fish presence at that time. EPA will use Best Management Practices to reduce turbidity and its impacts at that time. Therefore, short-term, negative effects of the interrelated capping at this site will be minimized, and the long-term effect of the capping will be beneficial. EPA's capping action, together with future dredging, are part of Commencement Bay Nearshore/Tideflats Superfund Site Remediation. The remediation is a series of discrete but associated actions to be evaluated under separate Section 7 ESA reviews. Appendix 1 lists the various actions contemplated for this portion of the Commencement Bay Nearshore/Tideflats Superfund cleanup. These actions include mitigation for short and long term loss of habitat, shipping operations, and all other remedial activities in the Hylebos and Middle Waterways.

In summary, EPA will minimize the effects of dredging on listed fish by working under timing restrictions to minimize fish presence, and use a specialized hydraulic dredge (TOYO pump) to

minimize resuspension of sediments. EPA will also monitor the chemical constituents, turbidity, dissolved oxygen and other in-water parameters, and will modify the dredging practices if any of the parameters exceed Clean Water Act water quality criteria.

2.1.5.1.2 Disposal

Prior to disposal, Area 5106 sediments will undergo rigorous treatment to reduce organic chemical concentrations to a degree that will minimize, if not preclude, the release of chemical constituents into the water column. This conclusion is based on the results of bench scale testing of the Area 5106 sediments (CRA 1999b). Subsequent laboratory tests placing the treated sediments into water yielded no measurable chemical migration (non-detect for the constituents sampled) from the treated sediments into the water column during and after placement. If some leaching does occur following placement of treated Area 5106 sediments into the Slip 1 CDF, the chemical concentrations in the water column are expected to be well below the water quality criteria for saltwater, given tidal mixing and the quantity of water available for mixing.

Disposal of treated and dewatered Area 5106 sediments in Slip 1, however, will minimally, and temporarily, elevate suspended sediment concentrations within the Slip 1 CDF. EPA will minimize the effects of elevated suspended sediment by using a closure berm at the entrance of Slip1, largely isolating these areas from the Blair Waterway and the remainder of the action area. Following project completion, the disposal material will be physically isolated from Commencement Bay, as part of the interrelated clean up actions, listed above. Moreover, EPA will monitor turbidity levels during disposal, and implement operational changes as necessary to comply with Water Quality Criteria at the mixing zone boundary. Thus, suspended sediment concentrations are not expected to reach levels dangerous to salmonids.

Related cleanup activities will also include disposal of treated contaminated sediments at Slip 1. These are also described in Appendix 1. Upon completion as a confined disposal facility, Slip 1 will become a commercial development as part of the Northern Expansion of Port of Tacoma's Terminal 3/4.

Because dredging of other Hylebos Waterway sediments is not scheduled to occur until the 2003/2004 in-water construction season, treated Area 5106 Sediments will remain accessible to listed salmonids through one in-water construction closure period. Based on bench-scale , the sediments should not pose a danger to listed salmonids (CRA 1999b). Further, sediments dredged from other portions of the Hylebos Waterway will be placed adjacent to and on top of the treated Area 5106 sediments in the CDF. These materials will be placed at depths below which juvenile salmonids are expected to feed and rear. Specifically, littoral habitats are considered the most important for salmonids during the initial weeks or months in the estuarine and marine environments. As they grow, salmonids tend to move away from the shallow nearshore areas into deeper water where they feed on larger pelagic prey (Healey 1991).

Juvenile salmonids are not usually considered to use the subtidal substrates below –10 ft MLLW. Thus, the vertical separation between treated Area 5106 sediments to be placed in the Slip 1

CDF before the closure berm is completed, the placement of other sediments dredged from the Hylebos Waterway on top of and adjacent to treated Area 5106 sediments and habitat utilization by juvenile salmonids will provide a collective buffer to minimize if not precluding exposure to these materials. For these reasons, though Area 5106 sediments disposed of in the Slip 1 CDF will be exposed to tidal influence during project construction, no measurable adverse affect on listed species is expected.

2.1.5.2 Indirect Effects

Indirect effects are caused by or result from the proposed action, are later in time, and are reasonable to occur (50 C.F.R. 402.02). Indirect effects may occur outside the area directly effected by the action. Indirect effects from this project are those impacts that would result from the future use of Slip 1 as a container terminal supporting shipping activities.

New shipping activities can further degrade habitat values for PS chinook. Increased ship arrivals, berthing, and departures at Slip 1 after it is filled may affect the physical habitat and rearing conditions of juvenile chinook and other salmonids in the vicinity due to the large ships generating abrupt current action. Ship propellers generate approximately 244,000 cubic feet. per minute currents and bow thrusters on the modern larger class vessels generate roughly 114,000 cubic feet. per minute currents (Mark Mulligan 2000, pers. comm. with USFWS). Filling Slip 1 would increased the number vessels entering Blair Waterway on their way to and from Terminal 3/4. An analysis conducted by the Corps (Nelson 1999) indicates that ship wakes result from several mechanisms, and the resultant impact on shoreline habitats is affected by the nature of the slope substrate. The Port has stated that the normal operation of post-Panamax container ships at Terminal 3/4 would normally be sufficiently removed to reduce any wash disturbance (Pacific International Engineering 2002) and performance criteria of the monitoring plan would require repair under the ACOE permit. The incremental increase in ship wakes from additional vessel traffic operating in Blair Waterway, therefore, is likely to be negligible, and is unlikely to be measurable. Further, because the slopes of Blair Waterway are protected by riprap they are resistant to erosion from normal ranges of ship wake and naturally generated waves.
Within the balance of the Action Area, the effect on the adjacent shoreline of wakes generated by even the largest ships that may call at Terminal 3/4 is less than that of wind-generated waves.

Additional impacts from increased shipping might also include excessive levels of ambient noise and light, water quality degradation from: 1) stormwater, 2) hull antifoulants (TBTs), 3) fuel spills, and 4) discharges. Pollutants (oil, toxic chemicals, radioactive materials, carcinogens, mutagens, teratorgens, or organic nutrient-laden water including sewage water) in a listed species' habitat can possibly cause take by harming fish. Water quality and quantity limitations are associated with triggering the onset of sublethal effects such as disease in previously infected salmonid populations. The onset of disease is thought to be exacerbated by the added stress of poor water quality and quantity conditions (NOAA Fisheries 1998c). Factors associated with urbanization, including pollutants, have been implicated in 58% of the declines and 9% of the extinctions among 417 surveyed stocks (NOAA Fisheries 1998d).

While U.S. regulations prohibit the anti-fouling agent tributyltin (TBT) based paints on vessels less than 25 meters in length and a maximum leaching rate of 4 micrograms/square centimeter/ day for vessels greater than 25 meters, these restrictions do not apply to foreign flagged ships calling on U.S. ports. Ninety percent of the ships that call at the Port have hulls painted with TBT. About 70 percent of the ships calling to the Port of Tacoma are foreign flagged vessels from about 30 different countries. Seven of these countries have some regulations regarding TBT but they are generally the same or less restrictive that the U.S. About 60 percent of the ships arriving at the Port of Tacoma are from countries that have no regulations on the use of TBT. It is estimated that two larger ships could release up to 1.14 kilograms a day based on the maximum leach rate, translating into a concentrations of the order of 0.1 to 0.5 parts per billion (ppb) in the Terminal 3/4 portion of the Blair Waterway. TBT is very toxic to marine organisms. Effects include: acute morbidity at 0.96 to 31 ppb in fish, from 0.33 to 1.03 ppb in some algae, and from 0.1 to 2.1 ppb in invertebrates. TBT can also cause growth effects or anatomical deformities at concentrations as low as 0.02 ppb in invertebrates (USEPA 1997). However, high levels may not be biologically available because of the potentially high rate of adsorption onto organic particles and into the sediments. NOAA Fisheries does not expect accumulations of TBT to reach levels that would adversely affect chinook. Also, the flushing of the Blair Waterway from wind and tides should keep the waterway relatively clean. Additional details are discussed in the Maersk Sealand Pier Extension Biological Opinion (NOAA Fisheries 2001).

Oil spills from increased bunkering activities of the larger ships presents further risks to chinook. In the past 10 years at least three bunkering mishaps have been documented within the action area. In 1992 and in 1993 two spills occurred in the Blair Waterway: the SUN ROSE spill was 850 gallons; the NOSAC FOREST spill was approximately 7000 gallons. In 1998 the Russian vessel the ANADYR spilled approximately 5000 gallons in the Sitcum Waterway. Because of the timing, the NOSAC FOREST spill was the worst spill, taking place during the juvenile chinook outmigration period. State biologists (Hooper 1993, pers. observ.) documented mortality and sublethal effects in White River spring chinook and their prey base, at that time identified as a "critically depressed" stock (Wash. SASSI 1992). While spills are not intended, the result of increased shipping activity is an increased probability that a spill will occur. Fortunately, improved bunkering standards developed by the U.S. Coast Guard and the Washington State Department of Ecology since the last spill could reduce this risk.

An additional indirect effect to PS chinook from increased shipping at Slip 1 might be an increase in the number of non-indigenous species in Commencement bay. Such species have already been identified from infauna and epifauna collections in Commencement Bay. Species are transferred to new environments, either intentionally or unintentionally, by many vectors, including: ship hulls, suction bays, and anchors, where organisms may attach or become entangled; commercial products, whereby organisms are unknowingly transferred along with cargo; and through discharge of ships' ballast water, which is necessary for safe ship operations. Ballast water may be taken on and discharged at the port of departure, in transit, and at one or more arrival ports (Moyle 1990, Committee on Ships' Ballast Operations 1996). While no adverse ecological effects have yet been noted in Commencement Bay due to the presence of these introduced organisms, the increase in the total volume of ballast water potentially

discharged to Commencement Bay increases the risk of introduction of detrimental non-indigenous species.

2.1.6 Cumulative Effects

Cumulative effects are defined as "those effects of future State or private activities, not involving Federal activities, that are reasonable certain to occur within the action area of the Federal action subject to consultation" (50 C.F.R. 402.02). The Project involves action within a portion of the Hylebos Waterway, which has been previously altered by dredging, filling and other anthropogenic activities. However, future Federal actions that will impact the action area, such as navigational dredging and other activities permitted under Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act, will be reviewed under separate Section 7 consultations, and cannot be considered cumulative effects.

The Port of Tacoma has almost 40% of the land available on the U.S. West Coast for container development and is actively working at upgrading road systems and railways to enable cargo to move quickly in and out of the port. The Port of Tacoma's anticipates spending $250 million in capital projects to accommodate larger ships, stimulate business growth, and to meet the Port's public responsibility. Again, virtually every future action to develop or restore will require a USACOE permit, triggering NOAA Fisheries review, therefore they cannot be considered as cumulative effects. The operation of the Port's facility, once developed, however will increase the number of truck and rail trips on existing roads and railroads. These are within the local or private actions that are considered to create potential cumulative effects. In this case, these uses are not expected to have any additional effect on the species of concern or their habitat.

The Port also typically retains responsibility for maintenance and repair requirements for the terminal facilities it constructs and leases, including pavement repair, building painting, roofing repair/replacement, rail and switch repair/replacement associated with intermodal yards, and fender system repair/ maintenance associated with pier structures. These activities are necessary to maintain good operating condition, protect against normal wear and tear, and protect the piers from structural damage that can happen when the fender system is damaged. Fender system damage requires immediate repairs because fender systems protect the structural integrity of piers and ships. A compromised fender system poses potential risks to the pier, the ships that use the pier, and the longshoremen, Port employees, and the Port's tenants active on the piers and ships. The fender systems must be repaired to maintain the terminal facility in a safe working conditions.

These terminal maintenance activities, whether they are Port or tenant initiated, will be conducted in a manner that ensures compliance with all applicable local, state, and federal laws and regulations, and permits that are in place for the facility. Repair or maintenance that entails in-water work that is embodied within the Project permits for the facility (including ESA consultations) will be conducted consistent with those approvals. These actions are not expected to have any additional effect on the species of concern or their habitat. In-water repair or

maintenance work that is not embodied within the Project permits and approvals would be conducted consistent with other applicable federal, state or local requirements.

Other effects in the action area are those from restoration actions taking place as a part of Commencement Bay Natural Resource Damage Assessment pursuant to CERCLA (USFWS and NOAA, 1997; Kerwin 1999). Landscape and watershed scale restoration sites have also been identified to increase connectivity between important salmon habitat transition regions (Simenstad 2000). It is particularly difficult to detect, with confidence, the effects of habitat improvements based on observed run size trends. It has been estimated that, because of inherent variability, it would take 30 years to detect a 50% improvement in average production, if we were to use adult run size as the response variable (Lichatowich and Cramer 1979, Mobrand Biometrics 2001).

2.1.7 Conclusion

Having evaluated the collective effects of the proposed or continuing action, the environmental baseline, and any indirect or cumulative effects, and taking into account measures for survival and recovery specific to the listed species' life stage, NOAA Fisheries finds that the project may result in short-term adverse impacts to chinook salmon due to in-water work activities. Of the 10 salmonid indicators, 7 were found to maintain, 1 (sediment quality) was found to restore and 2 (water quality and benthic prey) were found to temporarily degrade then return back to baseline conditions in Commencement Bay. Due to the potential for water quality impacts NOAA Fisheries agrees with EPA's conclusion that the current Project (Area 5106 Removal Action) could temporarily degrade the baseline condition for water quality at the point of Project dredging. Measures to avoid work in the juvenile salmonid migration period, and engineering controls, will help minimize adverse short-term effects to salmonids.

Over the long-term, removal of highly contaminated sediments is a beneficial aspect of the project that will restore the baseline condition for water quality. The baseline condition for benthic prey would also be temporarily degraded due to the short-term loss in productivity that would occur as a result of the Projects temporary disturbance of littoral habitat. NOAA Fisheries agrees with EPA's conclusions that the remedial action will address risks to the environment and public health, reduce the levels of chemical constituents in sediment and thereby help improve and restore salmon habitat in Commencement Bay.

Based on the foregoing, it is NOAA Fisheries' biological opinion that the action is not likely to jeopardize the continued existence of PS chinook. In arriving at a non-jeopardy conclusion for this action, the minimization measures were important to consider as is the ultimate goal of clean sediment substrates which supports increased benthic diversity and productivity. NOAA Fisheries finds that likely potential negative effects associated with the actual construction activities are expected to be minimized or eliminated through the adherence to the project design objectives and conservation measures.

2.1.8 Reinitiation of Consultation

This concludes formal consultation on this proposed action in accordance with 50 C.F.R. 402.14(b)(1). EPA must reinitate this ESA consultation if: (1) new information reveals effects of the action that may affect listed species in a way not previously considered:(2) new information reveals the action causes an effect to listed species that was not previously considered; or (3) a new species is listed or critical habitat designated that may be affected by the identified actions. In instances where the amount or extent of authorized incidental take is exceeded, any operation causing such take must cease pending conclusion of the reinitiated consultation.

2.2 Incidental Take Statement

Section 9 of the ESA and Federal regulations pursuant to Section 4(d) of the ESA prohibit the take of endangered and threatened species without special exemption. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct of listed species without a specific permit or exemption (50 C.F.R. 222.102) "Harm" is further defined by the NOAA Fisheries Final Rule to include significant habitat modification or degradation that results in death or injury to a listed species by "significantly impairing essential behavioral patterns such as breeding, spawning, rearing, migrating, feeding, and sheltering" (50 C.F.R. 222.102). "Incidental take" is take of listed animal species that results from, but is not the purpose of, the Federal agency or the applicant carrying out an otherwise lawful activity. Under the terms of Section 7(b)(4) and Section 7(o)(2), taking that is incidental to, and not intended as part of, the agency action, is not considered prohibited taking provided that such takings is in compliance with the terms and conditions of this incidental take statement.

An incidental take statement specifies the impact of any incidental taking of endangered or threatened species. It also provides reasonable and prudent measures that are necessary to minimize the effects and sets forth terms and conditions with which the action agency must comply in order to implement the reasonable and prudent measures.

2.2.1 Amount or Extent of Take Anticipated

While the in-water dredging activities of this action are scheduled to occur during a period of time (August 16 - February 14) when few individuals of the listed species are expected to be present, NOAA Fisheries is reasonably certain that the species will be present during the action. Therefore, NOAA Fisheries anticipates that some unquantifiable incidental take of PS chinook is probable from the project activities. While injury or death may unintentionally result during construction activities, harm is more likely to accrue by exposure of fish to unremediated contamination of the nearshore environment during juvenile rearing and migration.

Because Take also includes harm caused by habitat modifications, the extent of habitat affected by an action can be a surrogate measure for take. In this action, the amount of habitat modification authorized is the dredge footprint in Area 5106 is approximately the 0.23 acres

above -10 feet, MLLW, in the littoral zone where juvenile chinook salmon could be found, if any are present during the time of the year when the construction occurs.

If the area of dredging in the littoral zone exceeds 0.23 acres by more than 50% (0.12 acres), this would exceed the incidental take and require reinitiation of consultation. Accordingly, the reasonable and prudent measures were developed to address the extent of habitat effects, as described below.

2.2.2 Reasonable and Prudent Measures

The following reasonable and prudent measures (RPMs) are necessary and appropriate to minimize the take of PS chinook. The RPMs are integrated into the BA Addendum for the proposed project. NOAA Fisheries has included them here to provide further detail as to their implementation.

1. EPA will minimize take during construction by avoiding or minimizing adverse effects of dredging activities on PS chinook salmon.

2. EPA will minimize take during construction by avoiding or minimizing adverse effects of disposal activities on PS chinook salmon.

2.2.3 Terms and Conditions

In order to be exempt from the prohibitions of Section 9 of the ESA, the parties must comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms are non-discretionary. EPA should include these terms and conditions as remedial requirements under Superfund orders to OCC.

1. To implement reasonable and prudent measure 1:

   a) EPA shall comply with the work window detailed in the Opinion at Section 2.1.5.1.1

   b) Comply with all conservation measures appropriate for dredging from Section 14 of the BA Addendum.

2. To implement reasonable and prudent measure 2:

   a) EPA shall comply with the work window for disposal of the treated sediments not occur between February 15 and July 15, inclusive, of any year.

   b) Comply with all the conservation measures appropriate for disposal from Section 14 of the BA Addendum.

c) If additional materials are not placed over the treated sediments in Slip 1 by February 15, 2004, EPA shall initiate a contingency plan. The plan will involve the sampling of the disposed materials using Puget Sound Dredge Disposal Authority protocols for the top 10 cm for the chemicals of concern. If the analytical concentrations are less than the EPA Sediment Quality Objectives (SQOs) criteria for Commencement Bay sediment cleanups, no further actions are required. However, if any one chemical is more than four times (4X) SQO values or if any two or more chemicals exceed twice (2X) the EPA SQOs, the entire disposal site will be capped with at least one foot of clean material (sand or 2-inch minus, round, pit-run "fish mix") using the same construction technique as the original treated sediment placement.

3.0 MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

3.1 Background

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance Essential Fish Habitat (EFH) for those species regulated under a Federal fisheries management plan. Pursuant to the MSA:

- Federal agencies must consult with NMFS on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (§305(b)(2));
- NMFS must provide conservation recommendations for any Federal or State action that would adversely affect EFH (§305(b)(4)(A));
- Federal agencies must provide a detailed response in writing to NMFS within 30 days after receiving EFH conservation recommendations. The response must include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with NMFS EFH conservation recommendations, the Federal agency must explain its reasons for not following the recommendations (§305(b)(4)(B)).

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting this definition of EFH: Waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 C.F.R. 600.110). Adverse effect means any impact which reduces quality and/or quantity of EFH, and may include direct (*e.g.,* contamination or physical disruption), indirect (*e.g.,* loss of prey or reduction in species fecundity), site-specific or habitat-wide effects, including individual, cumulative, or synergistic consequences of actions (50 C.F.R. 600.810).

Any reasonable attempt to encourage the conservation of EFH must take into account actions that occur outside EFH, such as upstream and upslope activities, that may have an adverse effect on EFH. Therefore, EFH consultation with NOAA Fisheries is required by Federal agencies regarding any activity that may adversely affect EFH, regardless of its location.

The objective of this EFH consultation is to determine whether the proposed action may adversely affect designated EFH, and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects to EFH resulting from the proposed action.

3.2 Identification of EFH

Pursuant to the MSA the Pacific Fisheries Management Council (PFMC) has designated EFH for federally-managed fisheries within the waters of Washington, Oregon, and California. The designated EFH for groundfish and coastal pelagic species encompasses all waters from the mean high water line, and upriver extent of saltwater intrusion in river mouths, along the coasts of Washington, Oregon and California, seaward to the boundary of the U.S. exclusive economic zone (370.4 km)(PFMC 1998a, 1998b). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC), and longstanding, naturally-impassable barriers (*i.e.*, natural waterfalls in existence for several hundred years) (PFMC 1999). In estuarine and marine areas, designated salmon EFH extends from the nearshore and tidal submerged environments within state territorial waters out to the full extent of the exclusive economic zone (370.4 km) offshore of Washington, Oregon, and California north of Point Conception to the Canadian border.

Detailed descriptions and identifications of EFH are contained in the fishery management plans for groundfish (Casillas *et al.* 1998, PFMC 1998a), coastal pelagic species (PFMC 1998b), and Pacific salmon (PFMC 1999). Assessment of the effects to these species' EFH from the proposed action is based on these descriptions and information provided by EPA.

3.3 Proposed Actions

The proposed action and action area are detailed above in Section 1 of this document. The action area includes habitats that have been designated as EFH for various life-history stages of 17 species of groundfish, four coastal pelagic species, and three species of Pacific salmon (Table 1).

Table 1. Species of fishes with designated EFH in the estuarine composite of Puget Sound.

Groundfish Species	Sablefish *Anoplopoma fimbria*	**Coastal Pelagic Species**
Spiny Dogfish *Squalus acanthias*	Bocaccio *S. paucispinis*	anchovy *Engraulis mordax*
California Skate *R. inornata*	Brown Rockfish *S. auriculatus*	Pacific sardine *Sardinops sagax*
Ratfish *Hydrolagus colliei*	Copper Rockfish *S. caurinus*	Pacific mackerel *Scomber japonicus*
Lingcod *Ophiodon elongatus*	Quillback Rockfish *S. maliger*	market squid *Loligo opalescens*
Cabezon *Scorpaenichthys marmoratus*	English Sole *Parophrys vetulus*	**Pacific Salmon Species**
Kelp Greenling *Hexagrammos decagrammus*	Pacific Sanddab *Citharichthys sordidus*	chinook salmon *Oncorhychus tshawytscha*
Pacific Cod *Gadus macrocephalus*	Rex Sole *Glyptocephalus zachirus*	coho salmon *O. kisutch*
Pacific Whiting (Hake) *Merluccius productus*	Starry Flounder *Platichthys stellatus*	Puget Sound pink salmon *O. gorbuscha*

3.4 Effects of Proposed Action

As described in detail in Section 2.1.5 of this document, the proposed action may result in detrimental short- and long-term effects to a variety of habitat parameters. These adverse effects are:

1. Short term degradation of benthic foraging habitat during dredging activities.

2. Short term degradation of water quality (*e.g.,* elevated turbidity or the accidental release of contaminants including petroleum products, chemicals or deleterious materials) because of in-water construction activities (sediment dredging and disposal).

3.5 Conclusion

NOAA Fisheries believes that the proposed action may adversely impact the EFH for the groundfish, coastal pelagic, and Pacific salmon species listed in Table 1.

3.6 EFH Conservation Recommendations

Pursuant to Section 305(b)(4)(A) of the MSA, NOAA Fisheries is required to provide EFH conservation recommendations to Federal agencies regarding actions that would adversely affect EFH. While the conservation measures that EPA has built into this sediment cleanup and disposal project are generally applicable to EFH for the species listed in Table 1, NOAA Fisheries recommends the following measures to further minimize the potential adverse effects of the proposed project and conserve EFH:

1. Adopt Terms and Conditions 1a-b, as described in Section 2.2.3, to minimize EFH effect No. 1.

2. Adopt Terms and Conditions 2a-c, as described in Section 2.2.3, to minimize EFH effect No. 2.

3.7 Statutory Response Requirement

Please note that the MSA and 50 C.F.R. 600.920(j) require the Federal agency to provide a written response to NOAA Fisheries' EFH conservation recommendations within 30 days of its receipt of this letter. The response must include a description of measures proposed to avoid, mitigate, or offset the adverse effects of the activity. In the case of a response that is inconsistent with the EFH Conservation Recommendations, the response must explain the reasons for not following the recommendations, including the scientific justification for any disagreements over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects.

3.8 Supplemental Consultation

EPA must reinitiate EFH consultation with NOAA Fisheries if the proposed action is substantially revised in a manner that may adversely affect EFH, or if new information becomes available that affects the basis for NOAA Fisheries' EFH conservation recommendations (50 C.F.R. 600.920(k)).

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APPENDIX - A

Commencement Bay Nearshore/Tideflats Project Element Breakdown

Appendix - A

Table1: Commencement Bay Nearshore/Tideflats Project Element Breakdown - Cumulative Impacts and Project Tracking

Project Element	Managing Entity	Consultation Type	In-Water Construction Schedule	Schedule for BE/BA Submittal	Notes	Date for EPA Approval
Slip 1 Pier 1 and Pier 2 Demolition[1]	OCC and POT	Informal	8/02 - 2/14/03	August 16, 2000, revised October 2001; Letter with road map submitted July 1, 2002	Submitted to EPA and the Services	July 22, 2002
Area 5106 Removal Action (dredging and disposal)[2]	OCC	Formal - NMFS Informal - USFWS	9/02 – 2/14/03	July 2, 2002	Submitted to EPA and the Services	July 2002
Slip 5 Habitat Site Construction – Phase I[3, 4]	POT	Informal	9/02 – 2/14/03	August 16, 2000, revised October 2001; Letter with road map will be submitted July 2002	The BA for Terminal 3/4, which includes this analysis was previously submitted to EPA and the Services. The letter with road map will address the fact that the "bench" will now be built above –10' MLLW.	July 2002
Slip 1 Berm Construction[5]	OCC and POT	Informal	11/02 – 2/14/03 12/03 – 2/14/04	August 16, 2000, revised October 2001; Letter with road map will be submitted July 2002	The BA for Terminal 3/4, which includes most of this analysis was previously submitted to EPA and the Services. The letter with road map will address the features that are different (i.e., key excavation and	August 2002

[1] Includes warehouse and lunchroom structures above their pier supported platforms
[2] Includes potential water quality impacts of treatment, dewatering and placement in the Slip 1 CDF
[3] Includes Stage 1 and Stage 2 fill to –10' MLLW
[4] All Slip 5 habitat construction associated with the EPA action and the modified Terminal 3/4 Corps permit will be conducted concurrently during the 2002-2003 and 2003-2004 in-water construction seasons.

Project Element	Managing Entity	Consultation Type	In-Water Construction Schedule	Schedule for BE/BA Submittal	Notes	Date for EPA Approval
					temporary buttress).	
Slip 1 Fill[6]	OCC and POT	Formal	11/02 – 2/14/05	August 16, 2000, revised October 2001; Letter with road map will be submitted September 2002	The BA for Terminal 3/4, which includes this analysis was previously submitted to EPA and the Services.	November 2002
Pioneer/Occidental Embankment Pilot Cap	OCC	Informal	8/16/03 – 2/14/04	To be scheduled		To be scheduled
Pioneer/Occidental Embankment Capping Action	OCC	Informal	7/16/04 – 12/04	To be scheduled		To be scheduled
Slip 5 Habitat Site Construction – Phase II[4, 7]	POT	Informal	7/16/03 – 2/14/04	August 16, 2000, revised October 2001; Letter with road map will be submitted September 2002	The BA for Terminal 3/4, which includes this analysis was previously submitted to EPA and the Services.	November 2002
Hylebos Waterway Segment 5 (dredging and disposal)[8]	OCC and POT	Formal	7/16/03 – 2/14/04 7/16/04 – 12/04	September 26, 2001	Submitted to EPA and the Services	January 2003
Hylebos Waterway Segments 3 and 4 (dredging and disposal)[9]	OCC and POT	Formal	7/16/03 – 2/14/04 7/16/04 – 12/04	November 2002		January 2003
Middle Waterway (dredging, capping and disposal)[10]	MWAC	Informal	7/16/03 – 2/14/04	Pending meeting with Services	BA Previously Submitted to EPA and the Services	January 2003

[5] Phase I – key excavation and construction of lower berm to –5' MLLW; Phase II – construction of upper berm to +18' MLLW.

[6] Includes all habitat impacts in Slip 1 (i.e., conversion of aquatic habitat to uplands and the face of the closure berm) resulting from the action. Includes construction of the primary and final caps. (Note: the action includes ballast, paving, lighting, fencing, drainage, and new stormwater outfall.)

[7] Includes completion to final grade including all habitat substrates, LWD cover structures, and removal of the pier platforms and piling for the warehouse and lunch room.

[8] Includes potential water quality impacts of placement of Segment 5 sediments in the Slip 1 CDF and Segment 5 dredging slated for disposal at the PSDDA open-water disposal site.

[9] Includes potential water quality impacts of placement of Segments 3 and 4 sediments in the Slip 1 CDF and Segments 3 and 4 dredging slated for disposal at the PSDDA open-water disposal site.

[10] Includes potential water quality impacts of placement in the Slip 1 CDF.

Project Element	Managing Entity	Consultation Type	In-Water Construction Schedule	Schedule for BE/BA Submittal	Notes	Date for EPA Approval
Excess Capacity Sediment Disposal in Slip 1	OCC and POT	Formal	10/03 – 2/14/04 7/16/04 – 10/04	To be scheduled		January 2003
Pier 25 Embankment Capping Action	POT	Informal	7/16/04 – 2/14/05	To be scheduled		To be scheduled
Segment 3 and 4 Embankment Actions	OCC and POT	Informal	7/16/04 – 2/14/05	To be scheduled		To be scheduled
Clear Creek Habitat Improvement Project – Phase II	POT	Informal	6/15/03 – 9/15/03	August 16, 2000, revised October 2001	Consultation Complete	November 2002
Modified Terminal 3/4 Permit[4, 11]	POT	Informal	9/02 – 2/14/03 7/16/03 – 2/14/04 7/16/05 – 2/14/06 7/16/06 – 2/14/07	August 16, 2000, revised October 2001; Letter with road map will be submitted July 2002 for modified permit action	The BA for Terminal 3/4, which includes this analysis was previously submitted to the Corps and the Services, and to EPA.	N/A (Corps approval needed by end of July 2002)

[11] Includes a 750' Pier Extension, Trestle, 0.29-acre Slip 1 mitigation beach replacement in Slip 5, and demolition of Pier 1D and Pier 5 in Slip 5.